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13. ABSTRACT *(Maximum 200 words)*

High-frequency instrumentation was acquired to perform: a) high-frequency dielectric measurements on poled electro-active polymers and to determine the stability when exposed to microwave radiation, and b) electro-optic measurements of the resonant enhancement of nonlinear polymers with demonstrated photochemical stability. In particular, the equipment was used to investigate large-bandwidth, traveling wave polymeric in-line fiber (PILF) modulator that is being co-developed by UC Davis and Optivision. This PILF amplitude modulator consists of a fiber half-coupler substrate evanescently coupled to a multimode electro-optic waveguide. PILF modulators are intrinsically rugged, exhibit low third order intermodulation nonlinearity and can be produced at lower cost than fiber pigtailed modulators. The equipment consisted of a high-frequency probe station, high-frequency amplifier and signal generator, 15 GHz photodetector, low relative intensity noise fiber coupled 1330 nm laser, and a 1064 kiode pumped laser. The deviations from the orginal budget are that the $30K in UC cost sharing was used towards a laser ablation accessory for the probe station (instead of the thermal evaporator), the elimination of the 1550 nm laser source and the purchase with fund remaining a high-frequency signal generator.

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Final Report: **Characterization of Nonlinear Polymers for High-speed Photonic Response and Nonlinear Dispersion**

André Knoesen
UC Davis

Summary: High-frequency instrumentation was acquired to perform: a) high-frequency dielectric measurements on poled electro-active polymers and to determine the stability when exposed to microwave radiation, and b) electro-optic measurements of the resonant enhancement of nonlinear polymers with demonstrated photochemical stability. In particular, the equipment was used to investigate large-bandwidth, traveling wave polymeric in-line fiber (PILF) modulator that is being co-developed by UC Davis and Optivision. This PILF amplitude modulator consists of a fiber half-coupler substrate evanescently coupled to a multimode electro-optic waveguide. PILF modulators are intrinsically rugged, exhibit low third order intermodulation nonlinearity and can be produced at lower cost than fiber pigtailed modulators. The equipment consisted of a high-frequency probe station, high-frequency amplifier and signal generator, 15 GHz photodetector, low relative intensity noise fiber coupled 1330 nm laser, and a 1064 diode pumped laser.

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Description	Supplier	Cost
Probe Station Package + Accessories	Cascade	$63,979.72
Signal Generator	Hewlett Packard	$22,745.58
Microwave Amplifier	Hewlett Packard	$19,522.18
Infrared Laser 1319 nm	ATX Telecom	$22,415.25
Infrared Laser 1064 nm	Coherent	$19,330.00
Miscellaneous RF Parts	Insulated Wire	$3,194.27
Total		$151,187.00
COST SHARING BY UC DAVIS		$ 30,000.00
	Total	$121,187.00